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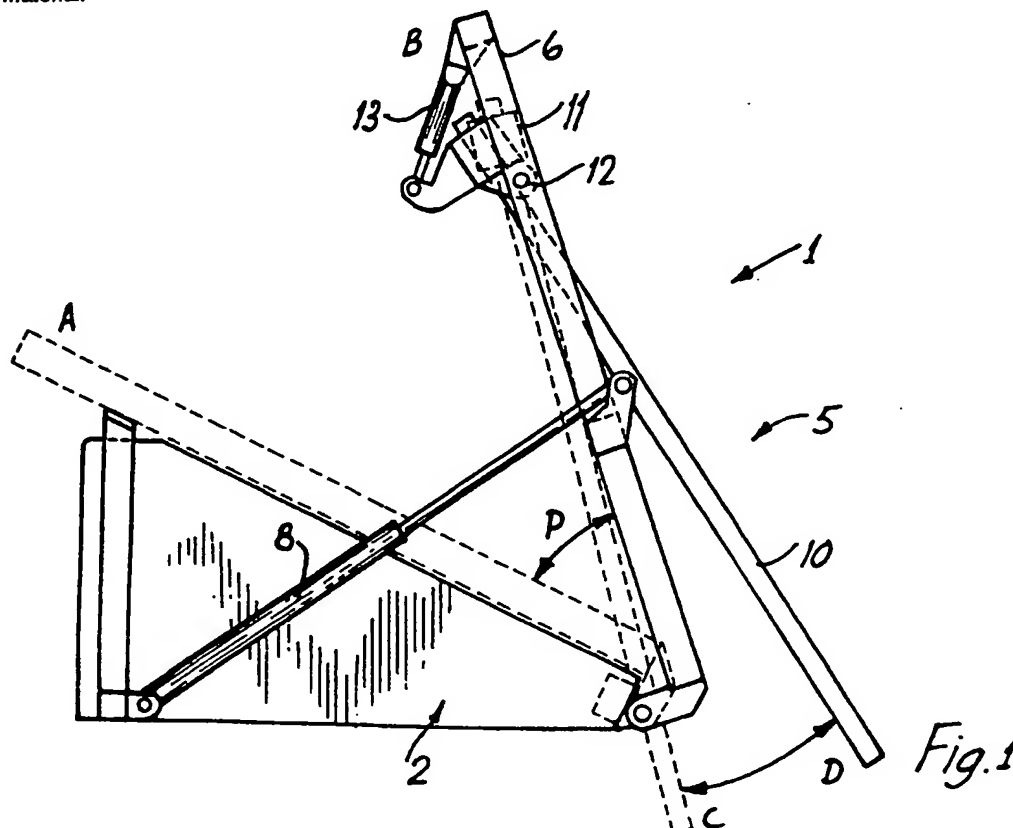
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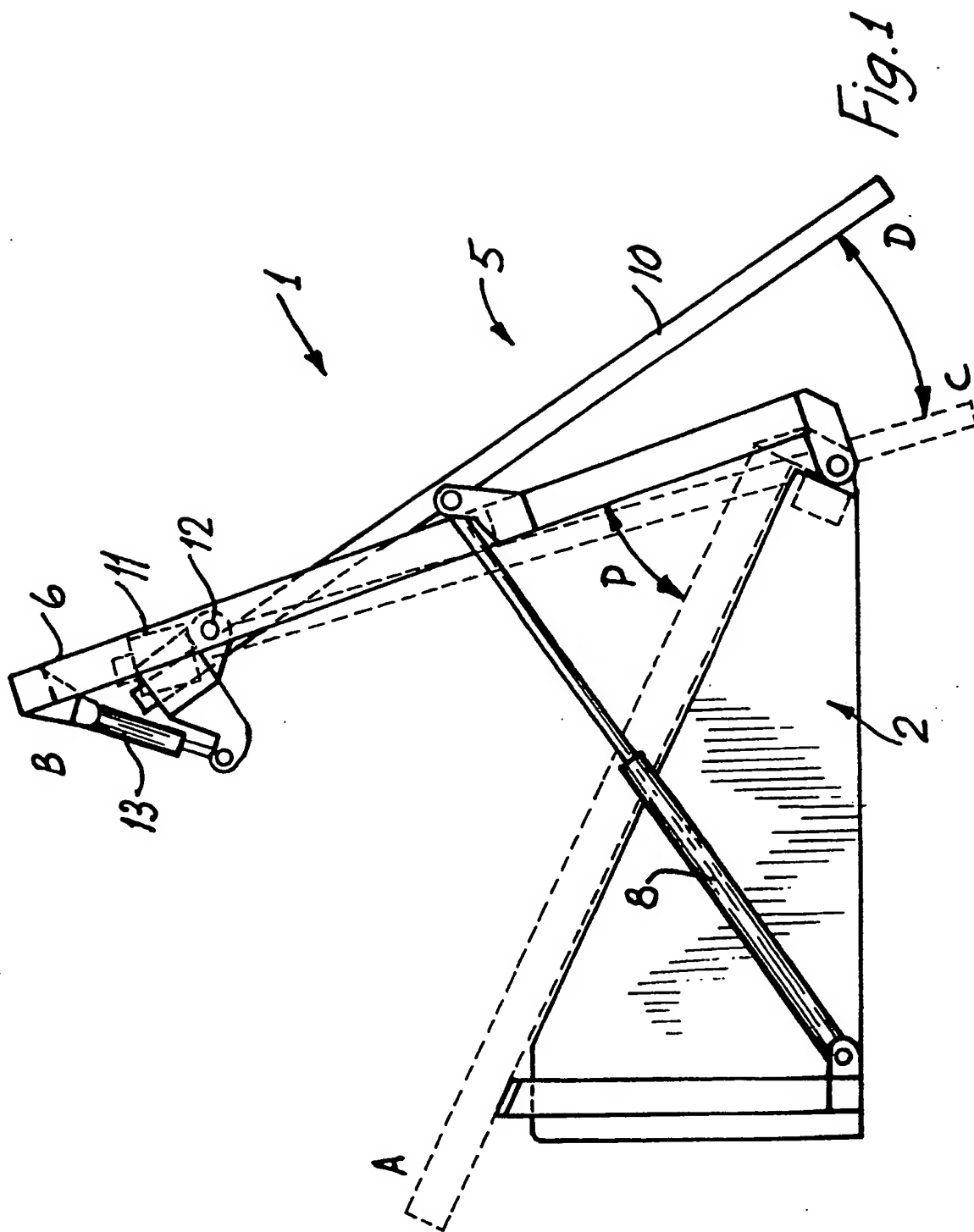
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(54) A hopper grid

(57) A hopper grid (1) has parallel grid bars (10) secured at their upper ends to a cross-bar (11) which is pivotally connected to a grid frame (6). Hydraulic rams (13) mounted between the grid frame (6) and the cross-bar (11) oscillate the grid bars (10) in a jolting action back-and-forth (C-D) when the hopper grid (5) is in a discharge position (B) to clear the bars of adherent material.



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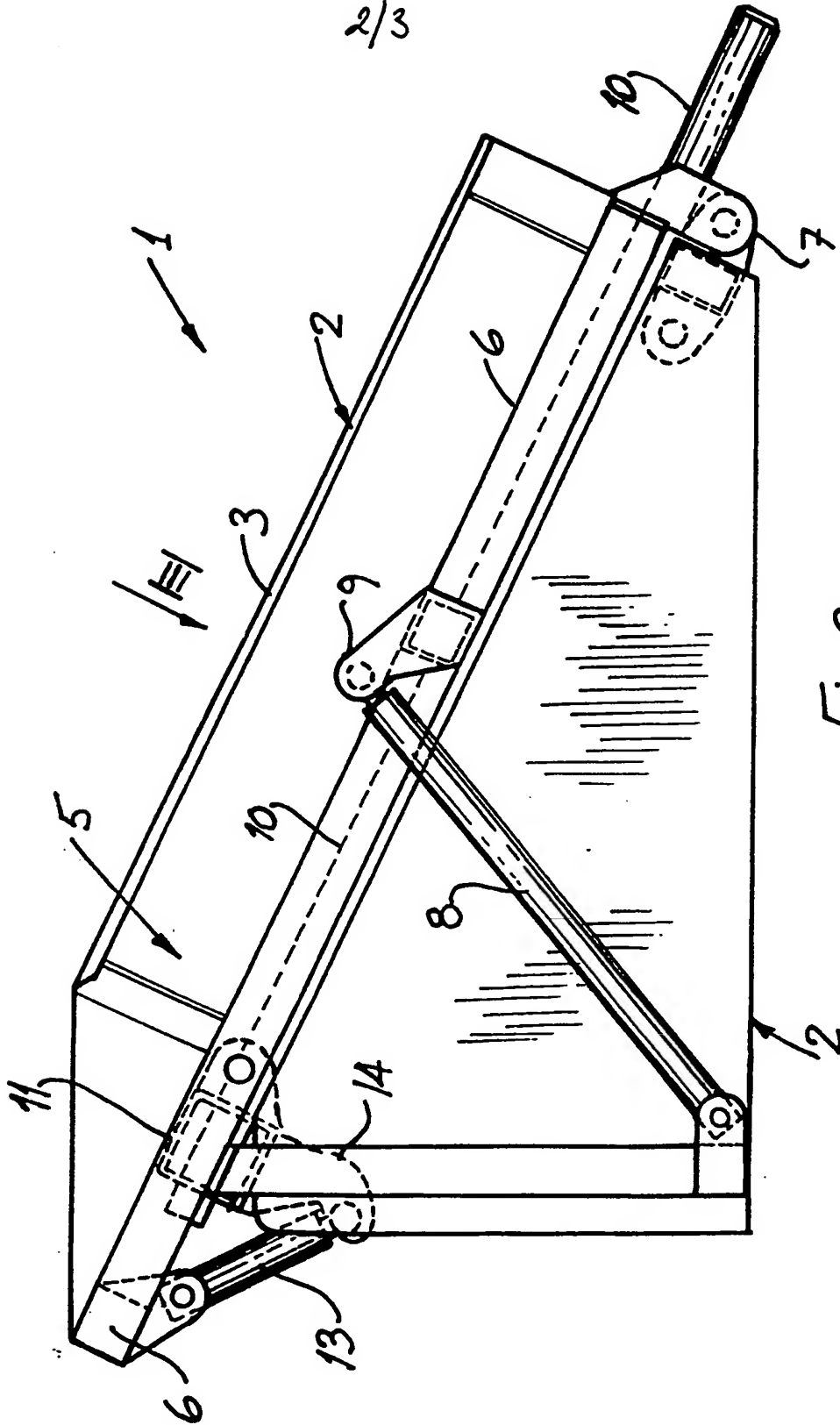


Fig. 2

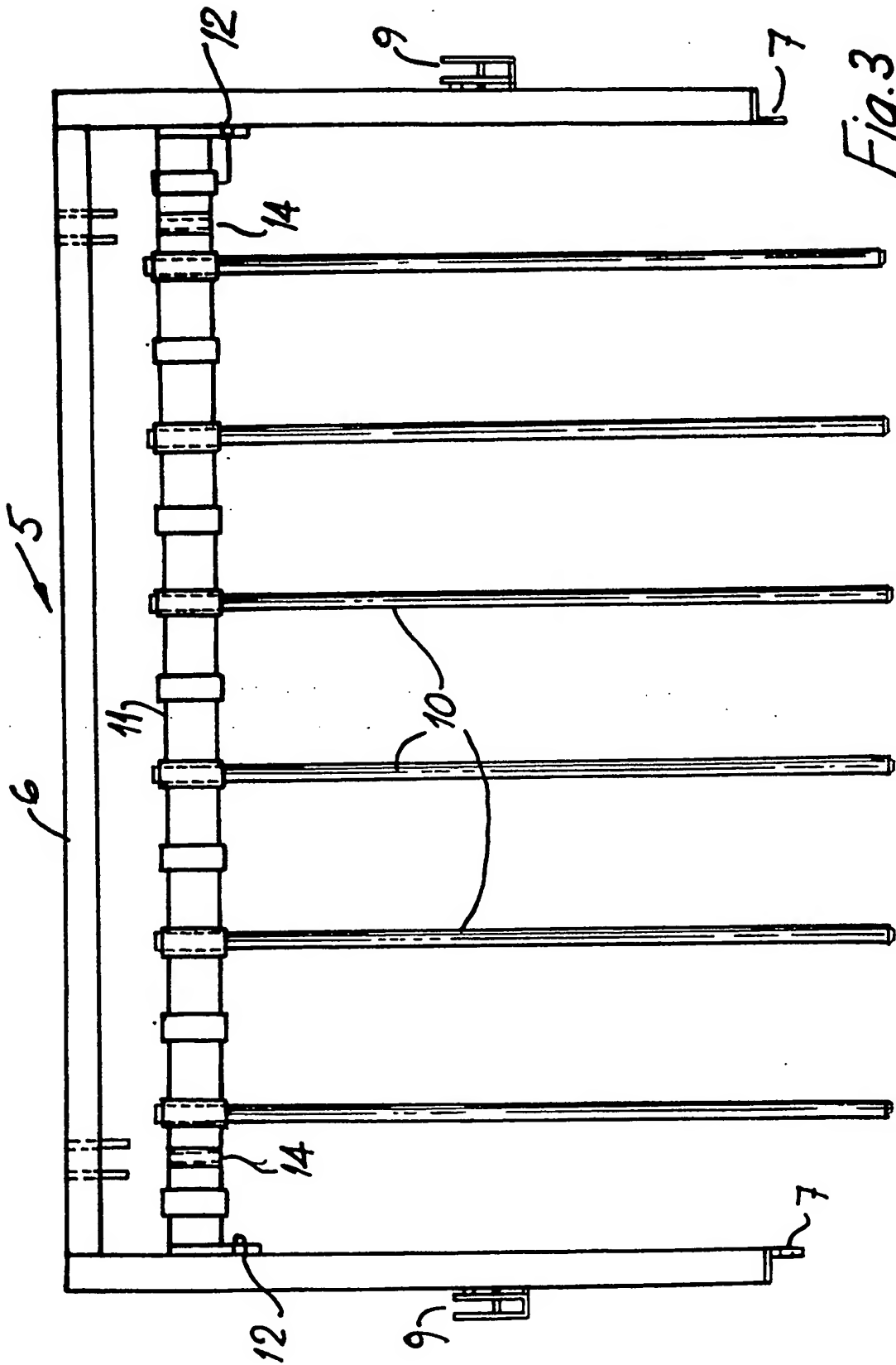


Fig.3

- 1 -

"A hopper grid"

The invention relates to a hopper grid for pre-separation of aggregate such as top soil, waste material, garbage or coal.

Such hopper grids are generally mounted on a base, which may be the hopper itself, for movement between an operative  
5 position over the hopper and a discharge position closer to the vertical for discharging of material resting on the grid bars.

A disadvantage with such hopper grids is that material which is caught between grid bars or which is sticky, as often  
10 happens when garbage is being handled, does not drop away easily. In this case the material must be manually removed, which task is time-consuming and reduces efficiency of the hopper grid.

The invention is directed towards providing an improved hopper  
15 grid to overcome these problems.

According to the invention, there is provided a hopper grid comprising grid bars, a grid frame and means for mounting on a hopper for movement between operative and discharge positions, wherein at least one of the grid bars is pivotally

connected to the frame for jolting movement back-and-forth under the action of an actuating means.

Preferably, the actuating means acts on the grid bar relatively close to it's pivotal axis.

- 5 In one embodiment, the actuating means acts on the pivoted bar at the upper end, the lower end being free.

In another embodiment, the actuating means comprises an hydraulic ram mounted between the grid frame and the grid bar.

- 10 Ideally, there are a plurality of pivoted grid bars secured to a cross-bar which is pivotally connected to the grid frame.

- According to another aspect, the invention provides a hopper grid assembly comprising a base having means for mounting on a hopper, drive means for movement of the hopper grid between operative and discharge positions, and a hopper grid as  
15 claimed in any preceding claim.

The invention will be more clearly understood from the following description of some preferred embodiments thereof, given by way of example only with reference to the accompanying drawings in which:-

Fig. 1 is a diagrammatic representation of a hopper grid of the invention;

Fig. 2 is an elevational view of the hopper grid; and

5 Fig. 3 is a plan view in the direction of the arrow III of Fig. 2, showing the arrangement of grid bars and frame.

Referring to the drawings, there is illustrated a hopper grid assembly of the invention, indicated generally by the reference numeral 1. For clarity, the hopper grid assembly 1  
10 is illustrated in schematic form in Fig. 1. In this embodiment, the hopper grid assembly 1 comprises a base 2 of box construction suitable for fitting to the top of a hopper. The base 2 has splayed side walls 3 to facilitate reception of material such as garbage for separation according to size.

15 The assembly 1 comprises a hopper grid indicated generally by the reference numeral 5 having a rectangular frame 6 open on the lower side. The frame 6 has a pair of brackets 7 at the lower end for pivotal connection to the base 2. A pair of primary two-way hydraulic rams 8 are mounted between the base  
20 2 and a pair of brackets 9 on the frame 6 for movement of the grid 5 between a lower, operative position shown by interrupted lines A and an upper discharge position B closer to the vertical, as shown in Fig. 1.

The grid 5 comprises a set of parallel grid bars 10 which are secured at their upper end to a cross-bar 11. The cross-bar 11 is pivotally connected at a pivot joint 12 to the frame 6. A pair of two-way hydraulic rams 13 are mounted between the transverse bar of the frame 6 and downwardly-depending brackets 14 secured to the cross-bar 11.

In operation, the assembly 1 is mounted on the top of a hopper and when in this position, the base 2 would form the upper portion of a hopper for reception of material. As material is loaded onto the grid 5, only the smaller parts pass through the bars 10 to the hopper. Needless to say, the spacing between the bars 10 is set according to the grading required. When larger parts have gathered on top of the grid bars 10, the hydraulic rams 8 push the grid 5 to the discharge position B, as shown in Fig. 1, in which case the material is free to drop off the bars. It will be noted that the lower end of the bars 10 are free and the frame does not extend across the bars at the lower end. Thus, there is an uninterrupted path for material to drop off the grid 5. However, in addition to this discharge action the hydraulic rams 13 are operated by a control mechanism to expand and contract quickly. This causes the cross-bar 11 and thus the grid bars 10 to oscillate in a jolting action between a lower position C and an upper position D as shown in Fig. 1. The jolting action is about the pivot joint 12 on the frame 6. It will be noted that



because the bracket 14 is relatively close to the pivot axis through the pivot joints 12, a relatively short movement of the rams 13 is required to cause a relatively large sweep of the bars 10. This is illustrated clearly in Fig. 1. This

5 jolting action of the bars causes sticky material or material which is wedged between bars to drop away and thus considerably improves efficiency of clearing of the grid 5. This is of considerable importance when the material being handled is garbage, parts of which may adhere to the bars 10.

10 Not only does the invention considerably improve the efficiency of a hopper grid but it avoids the potential for accidents which would otherwise be caused by an operator manually trying to remove items from the grid bars 10. This is very important for safety.

15 Needless to say, the invention is not limited to the embodiments described. For example, it is envisaged that not all of the grid bars may be actuated in a jolting action. Further, each grid bar may be independently oscillated with respect to the frame and it is also envisaged that an

20 actuating means other than a hydraulic ram may be used. Further, it is not essential that the grid bars be parallel and it is envisaged that cross-bars may also be included to form a mesh.

It will be appreciated that the invention provides a simple, inexpensive and effective solution to the problem of dislodging material from grid bars.

The invention is not limited to the embodiments hereinbefore  
5 described, but may be varied in construction and detail.

CLAIMS

1. A hopper grid comprising grid bars, a grid frame and means for mounting on a hopper for movement between operative and discharge positions, wherein at least one  
5 of the grid bars is pivotally connected to the frame for jolting movement back-and-forth under the action of an actuating means.
2. A hopper grid as claimed in claim 1, wherein the actuating means acts on the grid bar relatively close to  
10 it's pivotal axis.
3. A hopper grid as claimed in claim 1 or 2, wherein the actuating means acts on the pivoted bar at the upper end, the lower end being free.
4. A hopper grid as claimed in any preceding claim, wherein  
15 the actuating means comprises an hydraulic ram mounted between the grid frame and the grid bar.
5. A hopper grid as claimed in any preceding claim, wherein there are a plurality of pivoted grid bars secured to a cross-bar which is pivotally connected to the grid frame.
- 20 6. A hopper grid assembly comprising a base having means for mounting on a hopper, drive means for movement of the

hopper grid between operative and discharge positions,  
and a hopper grid as claimed in any preceding claim.

7. A hopper grid substantially as hereinbefore described  
with reference to and as illustrated in the drawings.